

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application:

1-9. (Cancelled)

10. (Cancelled)

11. (Currently Amended) A chuck device, according to claim 10, further comprising:

a first base member;

a second base member on said first base member;

first means in said first base member for receiving and increasing a rotational force;

second means in said first base member for receiving said rotational force from said first means and for increasing said rotational force into an increased rotational force;

said second means for receiving including means for redirecting said increased rotational force perpendicular to said first means for receiving and increasing;

means for converting said increased rotational force from said second means into an increased axial force perpendicular to said first and said second means;

said means for converting being operable between said first and said second base member, whereby said rotational force is transferred through said first base member to said second base member and converted into an increased axial force operable relative to said second base member;

means for chucking an external item in said second base member, said means for chucking receiving said increased axial force and securely chucking said external item to said second base member, whereby said external item is easily secured with a holding force magnified from said rotational force;

at least a first conversion member in said means for converting;

said second means for receiving including means for driving said first conversion member away from said first means for receiving and increasing;

at least a first sloped engagement groove on said first conversion member;

at least a first claw member in said means for chucking;

at least a first engagement section on said first claw member;

said first sloped engagement groove being sloped relative to a first direction of motion of said first claw member relative to said second base member;

said means for chucking including means for operating said at least first claw member axially along an axial direction of said second base member;

said first sloped engagement groove engaging said first engagement section being effective to retain said first engagement section and to drive said first engagement section in said first direction of motion and fix said external item to said second base member, whereby said external item is secured to said chuck device;

at least a first worm gear in said first means for receiving and increasing;

at least a second worm wheel in said second means for receiving and for further increasing said rotational force operable about a first diameter;

said first worm gear having a first rotational axis and a second diameter;

said second diameter greater than said first diameter;
 said ~~second~~ worm wheel having a second rotation axis;
 said first rotational axis being perpendicular to said second rotational axis; and
 said first worm gear threadably engaging said ~~second~~ worm wheel and being effective to
magnifying said rotational force.

12. (Previously Presented) A chuck device, according to claim 11, further comprising:
 a first operational axis on said means for converting;
 said first operation axis being parallel said second rotational axis;
 said first operational axis being perpendicular to said an axial direction of motion of said
first claw member;
 said first operational axis being perpendicular to said first rotational axis;
 said first sloped engagement groove being sloped relative to said first operation axis; and
 said means for converting including means for receiving said increased rotational force and
operating along said second rotational axis, whereby said first claw member operates
simultaneously in said first direction of motion relative to said second base member and along said
first sloped engagement groove relative to said first conversion member.

13. (Previously Presented) A chuck device, according to claim 12, further comprising:
 at least a first engagement groove in said second base member;
 at least a first leg on first claw member;
 said first leg in said first engagement groove; and

said first engagement groove including means for engaging said first leg and operate said first claw member axially along said first direction of motion.

14-15. (Cancelled)

16. (Currently amended) A chuck device, according to claim 13, wherein:

said first base member includes at least a first hole and a second hole;

said first worm gear is disposed in said first hole;

said ~~second~~ worm wheel is disposed in said second hole;

at least a first cover;

said first cover being fitted on at least a first face of said first base member;

said at least first cover including means for operably retaining said first worm gear in said first hole and allowing external input of said rotational force;

at least a second cover;

said second cover being fitted on a second face of said first base member opposite said first face perpendicular to said second face; and

said at least second cover including means for operably retaining said ~~second~~ worm wheel in said second hole and allowing operation of said conversion member relative to said worm wheel.

17. (Previously Presented) A chuck device, according to claim 16, further comprising:

at least a first grease access in said at least first claw member;

said first grease access being parallel said first direction of motion; and
said first grease access being operable along a first face of said first sloped engagement
groove, whereby an external lubricant is easily applied between said conversion member and said
first engagement section effective to allow smooth operation of said chuck device.

18. (Previously Presented) A chuck device, according to claim 17, further comprising:

a second sloped engagement groove on said first conversion member;
a second claw member in said means for chucking;
at least a second engagement section on said second claw member;
said second sloped engagement groove being sloped relative to a second direction of motion
of said second claw member relative to said second base member;
said means for chucking including means for operating said second claw member axially
along said axial direction of said second base member; and
said second sloped engagement groove engaging said second engagement section to retain
said second engagement section and drive said second engagement section along said second
direction of motion and fix said external item to said second base member, whereby said external
item is secured to said chuck device.

19. (Cancelled)

20-26. (Cancelled)

27. (Cancelled)

28. (Currently Amended) The A chuck device according to claim 27, for chucking an external item, comprising:

a base member,

at least a first claw member moveable on said base member in a first direction between a first position wherein said claw member engages said external item and a second position wherein said claw member does not engage said external item,

a rotatable input member provided in said base member and configured to apply a rotational drive force,

a screw shaft member provided in said base member and moveable in a second direction substantially perpendicular to said first direction to apply an axial drive force,

a gear mechanism provided in said base member and coupled to said input member and said screw shaft member, wherein the gear mechanism is further configured to receive the rotational drive force from said input member and propel the screw shaft member in said second direction,

a conversion mechanism coupled to said screw shaft member and said claw member, wherein the conversion mechanism is further configured to receive said axial drive force and propel said first claw member in said first direction;

wherein said gear mechanism further comprises:

a worm gear mechanism having a worm gear coupled to said input member and a worm wheel coupled to said worm gear, and

a second gear mechanism coupled to said worm wheel and said screw shaft member, the second gear mechanism further configured to move said screw shaft member in said second direction guided by a threaded hole formed in said worm wheel in response to rotation of the worm wheel.

29. (Currently Amended) The chuck device according to claim 27 28, wherein said chuck device further comprises a second claw member moveable on said base member and wherein said first and second claw members are symmetrically moveable on the base member in said first direction.

30. (Previously Presented) A chuck device for chucking an external item, comprising:

a base member,

at least a first claw member moveable on said base member in a first direction between a first position wherein said claw member engages said external item and a second position wherein said claw member does not engage said external item,

an rotatable input member provided in said base member and configured to apply a rotational drive force,

a worm gear mechanism coupled to said input member and configured to decelerate said rotational drive force,

a screw shaft member provided in said base member and moveable in a second direction substantially perpendicular to said first direction to apply an axial drive force,

a second gear mechanism provided in said base member and coupled to said worm gear mechanism and said screw shaft member, wherein the second gear mechanism is further configured

to receive the decelerated rotational drive force from said worm gear mechanism and propel the screw shaft member in said second direction, and

a conversion mechanism coupled to said screw shaft member and said first claw member, wherein the conversion mechanism is further configured to receive said axial drive force and propel said first claw member in said first direction.

31. (Previously Presented) The chuck device according to claim 30, wherein:

said worm gear mechanism further comprises a worm gear coupled to said input member and a worm wheel coupled to said worm gear, and wherein

said second gear mechanism is coupled to said worm wheel and said second gear mechanism is further configured to move said screw shaft member in said second direction guided by a threaded hole formed in said worm wheel in response to rotation of the worm wheel.

32. (Previously Presented) The chuck device according to claim 30, wherein:

said claw member further includes an integral engagement section, and

said conversion mechanism further comprises a conversion member coupled to said screw shaft member, the conversion member having an angularly sloped engagement groove sloped relative to the first direction and slideably engaging with said integral engagement section.

33. (Previously Presented) The chuck device according to claim 32, wherein the sloped engagement groove has a substantially T-shaped cross section.

34. (Previously Presented) The chuck device according to claim 30, wherein:

 said base member further comprises a shared engagement groove, and
 wherein said chuck device further comprises a second claw member moveable on said base member and wherein said first and second claw members are symmetrically moveable on the base member in said first direction, each of said first and second claw members further comprising a leg portion slideably engageable with said shared engagement groove.

35. (Previously Presented) The chuck device according to claim 34, wherein said leg portion further includes a grease hole.

36. (Currently Amended) The chuck device according to claim ~~36~~ 34, wherein the shared engagement groove has a substantially T-shaped cross-section.

37. (Previously Presented) The chuck device according to claim 30, wherein the input member is further configured to receive a manual rotation force.

38. (Previously Presented) The chuck device according to claim 30, wherein said base member further comprises a lower base member and an upper based member coupled to said lower base member.